



*U.S. Department of Energy
and the
National Science Foundation*



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Professor Abraham Seiden
Chair, P5 Subpanel of HEPAP
University of California, Santa Cruz
1156 High Street
Santa Cruz, California 95064

Dear Professor Seiden:

As you know, the role of the P5 Subpanel is to advise and prioritize specific projects, at the request of the Department of Energy (DOE) and National Science Foundation (NSF), and to maintain the roadmap for the field. We would like P5 to begin the task of making a new roadmap for the next decade. This roadmap should be based on input from the various HEPAP subpanels, formed over the last few months, looking at specific sub-areas of particle physics. The roadmap should integrate the various projects into a coherent plan based on scientific promise, cost, and technical and budgetary constraints. There are major opportunities ahead of us – the Large Hadron Collider will soon be producing data, there is a consensus among high energy physicists worldwide towards an International Linear Collider, and a number of study groups and subpanels have laid out the opportunities in such other areas as neutrino physics, dark matter and dark energy.

Of course, the U.S. high energy physics program already has a suite of highly productive accelerator-based efforts at Fermilab, SLAC, and Cornell, and is now reaping the scientific output of the world-leading user facilities that were built in the 1990's. The particle physics community has been aggressive in trying to exploit these investments, and the payoff has been and continues to be a rich and diverse set of physics results. Now is the time to begin considering the next phase: a plan for the Tevatron Collider and PEP-II B-factory that also makes room for other initiatives important to realizing the grand opportunities of elementary particle physics. While the opportunities are great, the budgetary environment is difficult at best. Like all experimental programs, the Tevatron and B-factory will eventually reach the point where the scientific returns diminish, or are eclipsed by other facilities. The immediate question on which we ask your advice is: when would the significant resources that are now invested in operations of these facilities have a greater scientific impact if they were to be deployed otherwise.

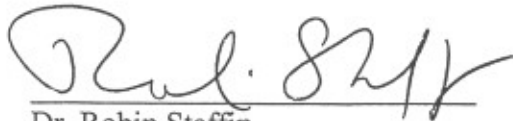
Current planning calls for PEP-II to be operated until the end of FY2008 at the latest, and the Tevatron collider to be operated until the end of FY2009. What factors or considerations might lead to stopping B-factory operations one year, or two years earlier than planned? When would we be in a position to make such a determination and what information would be needed? Similarly, for the Tevatron collider, what factors or considerations might lead to stopping operations one year, or two years earlier than now planned? What might lead to running longer than now planned? Again, when would we be in a position to make such a determination and what information would be needed?

In considering and commenting on these issues, you should understand these questions within the international context of HEP and what is planned at KEK-B and the LHC. For definiteness, you may assume a constant funding level for the overall US HEP program; do not assume that the geographic or programmatic distribution of those funds must remain as now. For the purposes of this exercise you should understand that there would likely be no funding for any new initiatives in neutrinos, dark matter and/or dark energy, and no significant ramp-up in ILC R&D until the operations of these facilities are completed. Again, for this exercise, you should assume the availability of redirected resources will strongly impact our ability to carry out smaller initiatives within the roadmap (for example in neutrino physics, dark matter, and dark energy), but will likely impact only weakly the start date for ILC construction, which will largely be determined by other factors.

The DOE and the NSF would like a draft recommendation regarding the two major facilities, in the context of an initial roadmap, by the end of October 2005, with a final report by the end of November. A separate request to construct a final roadmap will be made after the conclusion of the work being done by the various HEPAP subpanels addressing the sub-areas of particle physics.

Thank you in advance for your dedication to addressing these important and challenging questions.

Sincerely,



Dr. Robin Staffin
Associate Director
Office of High Energy Physics
Office of Science
Department of Energy



Dr. Michael Turner
Assistant Director
Mathematical and Physical Sciences
National Science Foundation

cc: Fred Gilman